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ABSTRACT

Two measures of Type A behavior in children were compared. The first, the Matthews Youth Test for Health (MYTH, 1980), is an instrument based on the factors of competitiveness-leadership and impatience-aggression. The second is the A-B Rating Scale (ABRS, 1982), a self-assessment measure for children that is based on the factors of restlessness-aggression, eagerness-energy, leadership, and alienation. In addition, the stability of MYTH scores over a 3-year period were measured and a principal component factor analysis of MYTH scores was conducted. Data were obtained in two waves. The first wave assessment involved 283 children in kindergarten to fourth grade at two elementary, one public, and one parochial school who were rated for Type A behavior by classroom teachers using the MYTH. Second wave data, collected 3 years later at participating first wave schools and a private, secular elementary school, involved 198 of the first wave students. These students rated themselves with the A-B Rating Scale and were assessed by a teacher with the MYTH. Findings showed that: (1) MYTH scores tended to remain stable over a 3-year span; (2) agreement between the two measures was weak; and (3) the two factors of the MYTH were intercorrelated more strongly than the four factors of the ABRS. (RH)

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# Comparison of Two Children's Measures of Type A Behavior

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Abstract

Matthews has developed the Matthews Youth Test for Health (MYTH, 1980) to assess Type A behavior in children. MYTH assessments are based on two factors: competitiveness-leadership and impatience-aggression (Matthews & Angulo, 1980). In addition, Hunter, Wolf, Sklov, Wenzl, & Berenson (1982) have independently developed a self-assessment Type A rating scale for children. The A-B Rating Scale is based on a total of four factors: restlessness-aggression, eagerness-energy, leadership, and alienation.

The present study had two objectives: 1) to measure the stability of MYTH scores over a 3-year period, and 2) to evaluate the extent to which the two measures of Type A behavior - the MYTH and the A-B scale - similarily assess the Type A construct in child populations. Also, a principal component factor analysis was performed on the obtained MYTH scores. Data obtained in the first wave was collected from two elementary schools, one public and one parochial (Catholic), so as to increase generalizability. A total of 283 children whose ages ranged from kindergarten to 4th grade were tested in this first wave. The second data wave, which collected data from 198 children (ages 3rd to 7th grades) involved the abovementioned elementary schools as well as a third school (non-religious private). Data obtained in this longitudinal study revealed that: 1) MYTH scores tend to remain stable over a three year span, $r(80) = .48 < .0001$, 2) there was only weak agreement between the two childrens' measures of Type A behavior, $r(109) = .12 < .11$ , and 3) the competitiveness/leadership and impatience/aggression factors of the MYTH were intercorrelated more strongly than the four factors of the A-B Rating Scale.

## Comparison of Two Children's Measures of Type A Behavior

The Type A behavior pattern (TABP) construct has been established as an independent risk factor for coronary heart disease by recent clinical research (Cooper, Detre, & Weiss, 1981). Type A behavior is characterized as a pattern of excessive impatient and aggressive behaviors as well as a strong sense of competitiveness, achievement striving, and time urgency. The Type B construct is characterized as the absence of these undesirable Type A traits.

Until recently, the Type A construct had been thought to be a phenomenon which only occurs within adult populations. However, Matthews and Angulo (1980) have suggested that it is likely that the antecedents of pattern A behavior can be traced to childhood experiences. Matthews has developed the Matthews Youth Test for Health (MYTH, 1980) to assess Type A behavior in child populations. MYTH assessments for children are based on two factors: competitiveness-leadership and impatience-aggression.

In addition, Hunter, Wolf, Sklov, Wenzl, and Berenson (1982) have independently developed a self-assessment Type A rating scale for children. They constructed their A-B Rating Scale from items taken from Bortner's (1969) measure of Type A behavior. The A-B Rating Scale is composed of 24 bipolar items; the child describes him or herself on a seven-point ladder between the two endpoints. Using the test-retest method, Hunter et al. have found the scale to be moderately reliable, $r = .59$ (Spearman-Brown correlation). They also examined the internal consistency of the scale by performing a principal components factor analysis with varimax rotation. It yielded the following four factors: eagerness-energy, restlessness-aggression, leadership, and alienation.

An important issue in the assessment of the TABP is the stability of the scores over time. Data collected by Visintainer and Matthews (1987) in both two-year and five-year longitudinal studies have indicated strong correlations (.38 and .39 respectively) for the test-retest periods for the MYTH. This data indicates that the TABP, as measured by the MYTH, is reasonably stable over a five year period of time. However, it is important that independent researchers replicate these findings and verify these scales' reliability and validity. The present study was designed to gather data which would show whether MYTH scores remain stable among grade school children over a three year period of time.

A second issue addressed by the present research concerns the agreement between the MYTH and the A-B Rating Scale. How

well do the two measures correlate? Data obtained by Jackson and Levine (1987) suggests that the two questionnaires overlap only slightly, yielding a weak correlation ($r$ = .21) and a concordance of Type A-Type B classifications that was only slightly above that expected by chance.

The dynamics of Type A behavior as assessed by the MYTH were investigated in our longitudinal study over three years which involved grade school children over a 4-year age span, so as to 1) provide evidence for or against the reliability and stability of the MYTH and, 2) compare those scores yielded by the MYTH to those obtained from the A-B Rating Scale. Also, a factor analysis was performed on the MYTH in order to determine whether the two factors previously identified are reliably obtained in other populations.

## Method

### Subjects

The age span for the first wave of data collection was kindergarten to 4th grade. We sampled children from two schools, one parochial Catholic school (A), and one public school (B), so as to increase generalizability. The second wave of testing occurred three years later in the two abovementioned schools as well as a third school, a non-religious private school (C). The age range for this secondary assessment was also four years: 3rd grade to 7th grade. A total of 283 children were tested on the first wave (see Table 1): 69 males and 66 females from school A, 72 males and 76 females from school B. Subjects were distributed relatively evenly between three grade ranges: kindergarten, 1st/2nd grades and 3rd/4th grades. The second wave of data collection included fewer children due to lack of funding for research assistants. A total of 37 males and 47 females from school A, 36 males and 29 females from school B, and 22 males and 27 females from school C were tested. The number of children who were tested in both waves of data collection totalled 81: 12 males and 18 females from school A and 26 males and 25 females from school B.

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Insert Table 1 about here

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### Procedure

For the first wave of testing, each child was assessed for Type A behavior by their teachers. The teachers assessments were

obtained by using the MYTH (Matthews & Angulo, 1980). The MYTH questionnaire consists of 17 items that reflect Type A behavioral qualities in children. The teachers rated each student on a 5-point scale according to how well that child's behavior reflected each of the 17 items of the MYTH, with the rating of one (1) being least characteristic and five (5) being most characterisic of the child's behavior. All items on each individual's questionnaire were tallied, yielding a composite score. Thus, the lowest possible score of 17 determined extreme Type B behavior and the highest composite score of 85 determined extreme Type A behavior in a particular child.

The second wave of data collection again used the same MYTH questionnaire on the same children, however, for all children the evaluator was a new teacher. In addition to the employment of the MYTH questionnaire in the second wave data collection, the A-B Rating Scale (Hunter et al., 1982) was also used to assess Type A behavioral qualities in the children of our sample. This particular questionnaire consists of twenty-four (24) items that also reflect Type A qualities in children. However, instead of the teachers making the behavioral assessments, the children assessed themselves on a 7-point scale (instead of the 5-point scale of the MYTH). The ratings were scored in the Type A direction and summed over the 24 items to obtain a total Type A score. The range for the yielded scores was 24 (extreme Type B) to 168 (extreme type A).

## Results

### Factor analysis of the MYTH

The results of our principal components factor analysis of the MYTH indicated very strong factor loadings for both the competitiveness/leadership and impatience/aggression factors associated with TABP. Factor 1 (impatience/aggression) of our analysis yielded an eigenvalue of 6.19 which accounted for 40.7% of the variance. Factor 2 (competitiveness/leadership) yielded an eigenvalue of 3.59 which accounted for 21.1% of the variance. Matthews and Angulo (1980) have also found that the MYTH yields these same two factors. No other derived factors yielded eigenvalues greater than one.

Table 2 compares the factor loadings of the two derived factors of the present study with those of Matthews and Angulo's factor analysis. As can be seen, there is a great deal of comparability between the factor loadings found by the two analyses. We can therefore conclude that their two-factor interpretation of the MYTH is reliable. Thus, it would seem that research using the MYTH should consider the MYTH as composed of two separate but related constructs: impatience/aggression and

competitiveness/leadership.

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Insert Table 2 about here

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We decided not to perform a factor analysis on the A-B Rating Scale because we lacked a sufficient number of subjects to obtain a reliable factor structure ($N$ = 135). Instead, we constructed four variables composed of the subjects' responses on the individual items making up the four factors that Wolf et al. have identified: 1) restlessness-aggression, 2) eagerness-energy, 3) leadership, and 4) alienation. These were used in subsequent correlations with other variables reported below.

Reliability of MYTH and A-B Rating Scale

Cronbach's alpha was computed for both of the two TABP scales on the second wave of data. The MYTH was found to possess a higher reliability coefficient (alpha = .823, $N$ = 176) than the A-B scale (alpha = .533, $N$ = 147). Thus, the MYTH would seem to be more internally consistent than the A-B scale.

Stability of the MYTH and correlation with the A-B Rating Scale

An important objective in the present study was to compare the obtained MYTH data from the first wave of data collection to the MYTH data obtained from the second wave. A moderately high correlation between first and second wave overall MYTH scores was found, $r(79) = .34$, $p < .001$, which indicates that the MYTH is a moderately reliable measure for young school age populations. The two component factors also seem to be reliable: the impatience-aggression factor of the MYTH yielded a high correlation, $r(79) = .42$, $p < .0001$, as did the competitiveness/leadership factor, $r(79) = .34$, $p < .001$.

A second objective in the present study was to compare the MYTH scores to the A-B Rating Scale scores (both from the second wave of data collection). The correlation between the two overall scale scores was weak and nonsignificant, $r(108) = .09$, $p = .18$. We next considered the question of whether the factors within each questionnaire were related to one another. For instance, how well did the impatience/aggression factor of the MYTH compare to the restlessness/aggression factor of the A-B Rating Scale? Correlations between MYTH and A-B factor scores are reported in Table 3. We had expected that the MYTH's impatience/aggression factor would correlate strongly with Wolf et al.'s restlessness/aggression factor. However, the correlation

was a weak one, $r(118) = .12$, $p = .10$. A comparison of the competitiveness/leadership factor of the MYTH to the leadership factor of the A-B scale was also predicted to yield a strong positive correlation. The two factors, however, yielded a weak correlation, $r(120) = .10$, $p = .14$, suggesting that the two factors were not related to one another.

Another interesting finding contained in Table 3 concerns the degree of correlation between the two MYTH factors for the first and for the second waves of data collection. The correlation for the first wave suggests that the two factors are related to one another, $r(302) = .41$, $p < .0001$. Further, the association is found to be stronger for the second wave, $r(176) = .60$, $p < .0001$.

How well do the A-B factors intercorrelate? Of six associations between Wolf et al.'s four factors, only two are significantly correlated: eagerness/energy with alienation, and restlessness/aggression with leadership. The four factors, then, do not seem to be highly intercorrelated. The relatively low alpha level reported above supports this observation.

## Discussion

The two main issues of the present paper were: 1) are MYTH scores stable for young grade school aged children over three years?, and 2) how well do MYTH and A-B Rating Scale scores correlate? In relation to the first question, we found the MYTH to be a moderately stable measure of TABP, yielding high correlations between first and second wave overall MYTH scores as well as yielding significantly high correlations once the scale had been broken down into its two component parts.

In relation to the second question, the correlation between the two overall scores of the MYTH and the A-B scales was found to be weak. In addition, correlations of similar factors between the two questionnaires were also weak.

Finally, we have shown that the two MYTH factors for the first wave of data are strongly correlated, suggesting that at younger ages children who are assessed as being competitive or having leadership qualities also tend to display impatient and aggressive behaviors. As children become older, these two factors become slightly more strongly correlated. A good question is whether this trend continues into adulthood.

The last issue of discussion centers on this question: Is the child a reliable and accurate rater of his/her own TABP behavior? Subjects may bias their self-ratings according to norms of social desirability. They are asked in the A-B Rating

Scale to respond to negative-sounding items such as, "I often get into fights", or "I lose my temper easily". Also, in responding to questions like those just mentioned, do children have an accurate sense of what is "a lot" or "a little" of these particular behaviors? How do children know what the average frequency of a given behavior is?

Our data indicate that the MYTH is both a reliable and internally consistent measure of TABP; the A-B scale is less so. We recommend that on occasions where only one measure of childrens' TABP can be employed in a study, the investigator should use the MYTH.

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Table 1

Distribution of Subjects Tested on the First and Second Data Collection Waves Distibuted by Gender, Age, and School

| | | Grade | | | | |
|---|---|---|---|---|---|---|
| School | Gender | K | 1st/2nd | 3rd/4th | 5th/6th | 7th |
| | | | | 1st wave | | |
| A | Boys | 23 | 22 | 24 | | |
| | Girls | 19 | 20 | 27 | | |
| B | Boys | 22 | 27 | 23 | | |
| | Girls | 22 | 23 | 31 | | |
| | | | | 2nd wave | | |
| A | Boys | | | 16 | 14 | 7 |
| | Girls | | | 10 | 21 | 16 |
| B | Boys | | | 17 | 14 | 5 |
| | Girls | | | 12 | 8 | 9 |
| C | Boys | | | 16 | 6 | |
| | Girls | | | 22 | 5 | |

Table 2

Factor Loadings of Matthews & Angulo's Data and the Present Data

| | Factor Loadings | | | |
|---|---|---|---|---|
| | Matthews & Angulo (1980) | | the present data | |
| Item Description | comp/lead | imp/agg | comp/lead | imp/agg |
| 1. Competitive (games) | .725 | .304 | .803 | .201 |
| 2. Rushes work | .449 | .095 | .685 | .202 |
| 3. Impatient (w/ peers) | .250 | .617 | .258 | .796 |
| 4. Preoccupied | .239 | .354 | .392 | .691 |
| 5. Patience (-) | -.073 | -.546 | -.178 | -.556 |
| 6. Interrupts | .116 | .688 | .268 | .802 |
| 7. Leader | .764 | -.045 | .798 | -.065 |
| 8. Irritable | .155 | .790 | .053 | .845 |
| 9. Competing-performance | .686 | .094 | .826 | .106 |
| 10. Argumentive | .270 | .763 | .383 | .706 |
| 11. Patient (w/ peers) | -.005 | -.594 | -.017 | -.794 |
| 12. Out performs peers | .794 | .162 | .808 | .146 |
| 13. Sits still (-) | .178 | -.500 | .170 | -.656 |
| 14. Important to win | .544 | .448 | .422 | .601 |
| 15. Chosen leader | .813 | -.187 | .743 | -.188 |
| 16. Competitive | .775 | .336 | .830 | .235 |
| 17. Fights | .169 | .735 | .129 | .757 |

Table 3

Correlation Matrix of 1st and 2nd Wave MYTH and 2nd Wave A-B Rating Scale

| | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1. Overall MYTH, 1st wave | .34** | .85** | .83** | .25* | .40** | .26* | .24* | .06 | .19 | .00 |
| 2. Overall MYTH, 2nd wave | | .44** | .18 | .93** | .85** | .09 | -.02 | .09 | .12 | .01 |
| 3. MYTH: Imp/Agg, 1st wave | | | .41** | .42** | .38** | .28* | .23* | .12 | .14 | .02 |
| 4. MYTH: Lead/Comp, 1st wave | | | | .05 | .34** | .19 | .19 | -.01 | .19 | -.01 |
| 5. MYTH: Imp/Agg, 2nd wave | | | | | .60** | .06 | -.05 | .04 | .10 | -.04 |
| 6. MYTH: Lead/Comp, 2nd wave | | | | | | .10 | .02 | .12 | .11 | .07 |
| 7. Overall A-B, 2nd wave | | | | | | | .83** | .38** | .31** | .45** |
| 8. A-B: Eagerness/ Energy | | | | | | | | .10 | .11 | .25* |
| 9. A-B: Restlessness/ Aggression | | | | | | | | | .18* | -.09 |
| 10. A-B: Leadership | | | | | | | | | | -.07 |
| 11. A-B: Alienation | | | | | | | | | | |

Note. * $p < .05$ ** $p < .001$.